भारतीयमानक
Indian Standard

IS 18064 : 2022

पवित्र तुलसी का तेल — विशिष्टि

Oil of Holy Basil — Specification

ICS 71.100.60

© BIS 2022

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुर शाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI - 110002
www.bis.gov.inwww.standardsbis.in

December 2022 **Price Group 6**

Fragrance and Flavour Sectional Committee, PCD 18

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Fragrance and Flavour Sectional Committee had been approved by the Petroleum, Coal and Related Product Division Council.

Holy basil, *Ocimum sanctum* (*tulsi*), is an aromatic plant that belongs to the family Lamiaceae. Holy basil is cultivated in the country for religious and medicinal purposes and for its essential oil. It is widely known across the Indian subcontinent as a medicinal plant and as herbal tea.

O. sanctum is one of the highly respected medicinal plants in India and thus most popular as 'holy basil'. This plant is mentioned in Ayurveda as lifesaving herb. *Ocimum sanctum* is believed to have immense medicinal value. The plant possesses wide ranges of pharmacological applications like antioxidant, antidiabetic, antifungal, cardio protection potential.

Recent advances in the biochemical and molecular study of phenylpropene synthases have strengthened our understanding of their evolution, structural properties, and reaction mechanism, providing insight into how plants produce and control the many types of volatiles of phenylpropene. Since phenylpropenes are crucial in determining the taste of foods and the quality of essential oils in cosmetics, the discovery of the genes and enzymes responsible for the biosynthesis of volatile phenylpropenes through genetic engineering has also provided us with resources to tackle the challenge of improving plant flavours.

Clause **4.1.3** includes purchaser and seller agreement.

The composition of the Committee, responsible for the formulation of this standard is given at Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

OIL OF HOLY BASIL — SPECIFICATION

1 SCOPE

This draft standard prescribes the requirements and the methods of sampling and tests for oil of holy basil, *Ocimum sanctum*.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 6597 shall apply.

4 REQUIREMENTS

4.1 Description

4.1.1 The oil shall be the product obtained by steam or hydro-distillation of leaves and stems of *Ocimum sanctum.*

4.1.2 The oil shall be pale yellow to yellowish clear liquid which darkens on ageing, free from sediment, suspended matter, separated water and adulterants. The oil shall be examined for its clarity, separated water and sediment as prescribed in IS 326 (Part 2).

4.1.3 The assessment of odour and appearance shall be subject to agreement between the purchaser and seller. The oil shall be tested olfactorily, especially for by-odours/by-notes, and for the presence of adulterants and impurities, if any, as per IS 2284.

4.2 Solubility

The oil shall be soluble in two to five volumes of ethanol (70 percent by volume), when tested by the method as prescribed in IS 326 (Part 6).

4.3 The oil shall also comply with the requirements given in Table 1 when tested according to the methods given in col **4** of Table 1.

Table 1 Requirements for Oil of Holy Basil
(*Clause* 4.3)

Sl No.	Characteristic	Requirement	Method of Test Ref. to IS/Annex
(1)	(2)	(3)	(4)
i)	Relative Density		IS 326 (Part 3) : 2006/ ISO 279:1998
	a) at 20 °C	0.9400 to 1.0393	
	b) at 27 °C	0.9526 to 0.9926	
ii)	Optical Rotation $[\alpha]_D^{20}$	(+) 1° to (-) 27°	IS 326 (Part 4) : 2005/ ISO 592 : 1998
iii)	Refractive Index		IS 326 (Part 5) : 2006/ ISO 592 : 1998
	a) at 20 °C	1.4900 to 1.5286	
	b) at 27 °C	1.5002 to 1.5202	
iv)	Phenol content as Eugenol, percent	16 to 73	326 (Part 12)/ ISO 1272 : 2000
v)	Flash point, °C, *Min*	96	326 (Part 26)

4.4 Chromatographic Profile

Gas Chromatographic Analysis for Oil of Holy Basil, is to be carried out as per Annex B. The proportions of the components in the chromatogram shall be as given in Table 2.

Table 2 Proportions of marker components in Oil of Holy Basil
(*Clause* 4.4)

Peak No.	**Components**	**Requirement, percent**	
(1)	(2)	*Min*	*Max*
(i)	(*E*)-β-ocimene	-	3.4
(ii)	Borneol	0.4	0.8
(iii)	Eugenol	40.1	72.9
(iv)	β-elemene	10.7	16.0
(v)	Methyl eugenol	0.1	4.5
(vi)	ß-caryophyllene	11.0	22.3
(vii)	Germacrene D	1.5	12.1
(viii)	Caryophyllene oxide	0.2	1.4

5 PACKING AND MARKING

5.1 Packing

The material shall be supplied in well closed containers permitting a minimum of air space, as agreed to between the purchaser and supplier.

The containers shall be well protected from light and stored in a cool and dry place.

5.2 Marking

Each container so filled shall be clearly marked with the following information:

a) Name of the material;
b) Name of manufacturer and his recognized trade mark, if any;
c) Year of manufacture;
d) Net and gross mass of the material;
e) Net Volume of the material;
f) Place of origin of the material; and
g) Batch no.

5.3 BIS Certification Marking

The containers may also be marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations made thereunder. The details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers, may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed in IS 326 (Part 1) : 1984.

6.2 Number of Tests

Tests for the determination of all the characteristics shall be conducted on the composite sample as prescribed in **4.3** and Table 1.

7 TEST METHODS

Tests shall be carried out as prescribed under **4.1**, **4.2, 4.4** and the appropriate references specified in col **4** of Table 1 and Annex A.

8 QUALITY OF REAGENTS

Unless specified otherwise, pure chemicals and distilled water [*see* IS 1070 : 1992 ‘Reagent grade water (*third revision*)’] shall be employed in the tests.

NOTE — ‘Pure chemicals’ shall mean chemicals that do not contain impurities which affect the result of analysis.

ANNEX A

(*Clause* 2)

LIST OF REFERRED STANDARDS

IS No.	*Title*
IS 326	Methods of sampling and test for natural and synthetic perfumery materials:
Part 1 : 1984	Sampling (*third revision*)
Part 2 : 1980	Preliminary examination of perfumery materials and samples (*second revision*)
Part 3 : 2006/ ISO 279 : 1998	Determination of relative density (*third revision*)
Part 4 : 2005/ ISO 592 : 1998	Determination of optical rotation (*third revision*)
Part 5 : 2006/ ISO 280 : 1998	Determination of refractive index (*third revision*)
Part 6 : 2005/ ISO 875 : 1999	Evaluation of miscibility in ethanol (*third revision*)
Part 12 : 2005/ ISO 1272 : 2000	Determination of phenols (*third revision*)
Part 26 : 2017	General guidance on determination of flashpoint
IS 2284 : 1988	Method for olfactory assessment of natural and synthetic perfumery materials (*first revision*)
IS 6597 : 2001	Glossary of terms relating to fragrance and flavour industry (*second revision*)

ANNEX B

(*Clause* 4.4)

GAS CHROMATOGRAPHIC ANALYSIS OF OIL OF HOLY BASIL

B-1 GENERAL

B-1.1 The chromatographic conditions given here are for information and for guidance only.

B-1.2 Outline of the Method

A representative port of the material is dissolved in a suitable solvent, if required, and the injected into gas chromatograph equipped with capillary column and flame ionization detector. On completion of chromatographic run, the chromatogram is acquired and area percent of each peak is automatically calculated and presented in the peak table.

B-2 APPARATUS

B-2.1 Gas chromatograph equipped with split/splitless inlet, capillary column and Flame Ionization Detector (FID).

B-2.2 Gas Chromatographic Conditions for Non-Polar Column

Sample size	*0.1 µl (diluted in hexane/ dichloromethane)*
Capillary column:	5% diphenyl in 95% polydimethyl siloxane
Material	polydimethyl siloxane
Length	30 m
Internal diameter	0.25 mm
Film thickness	0.25 µm
Carrier gas	Hydrogen/ Nitrogen (1 ml/min)
Flow split ratio	1: 40
Injector Type	split/splitless
Injection temperature	280 °C
Flow Control	Electronic/ Automatic
Detector:	
Type	Flame Ionization Detector
Temperature	280 °C
Flow Control	Electronic/ Automatic
Oven Temperature Programming:	
Temperature 1	60 °C
Ramp 1	3 °C/min
Temperature 2	240 °C isothermal for 2 min.
Ramp2	5 °C/min
Temperature 3	280 °C

B-3 CALCULATION

A-3.1 Area percent (%) of each baseline separated peaks is automatically calculated and presented in result section of acquired gas chromatogram of *O. sanctum* essential oil.

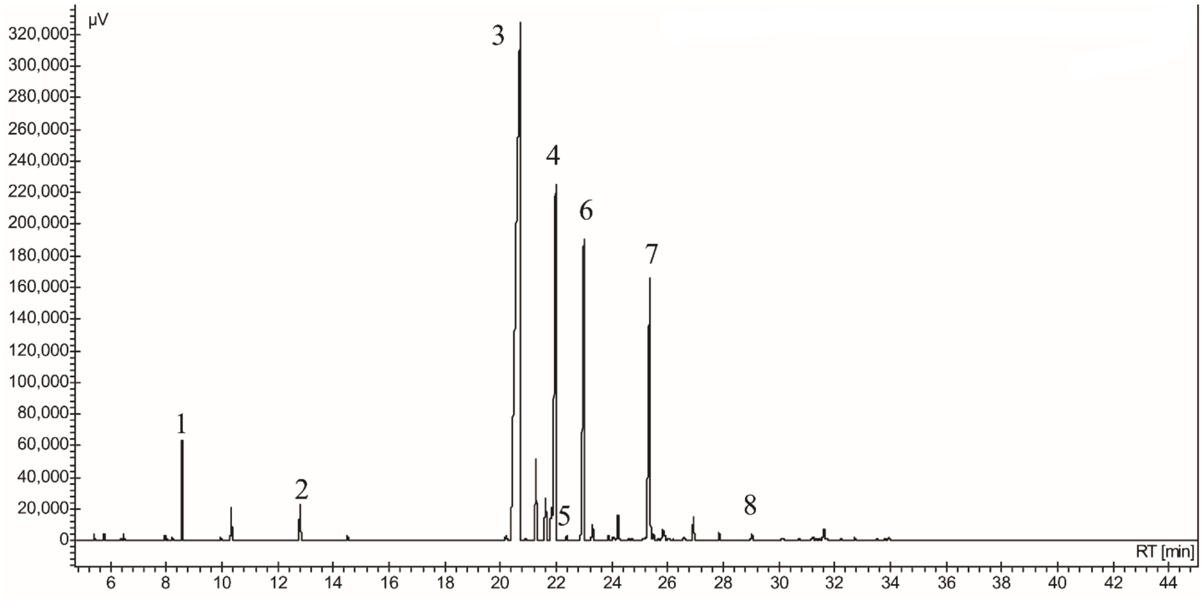

FIG. 1 TYPICAL CHROMATOGRAM OF *Ocimum sanctum* OIL ACQUIRED ON A NON-POLAR COLUMN

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Fragrance and Flavour Sectional Committee, PCD 18

Organization	*Representative(s)*
CSIR-Central Institute of Medical and Aromatic Plants, Lucknow	Dr Prabodh K. Trivedi (***Chairperson***)
All India Agarbathi Manufacturers Association, Bengaluru	Shri Sarath Babu P.S
Aroma Sales Corporation, New Delhi	Shri Sunil Kumar Jain
Central Drugs Standard Control Organization, New Delhi	Shri Aseem Sahu
Central Drugs Testing Laboratory, Chennai	Shrimati C. Vijayalakshmi
Central Revenue Control Laboratory, New Delhi	Shri Suneel Mathur Shri Praful Dalal (*Alternate*)
Centre for Aromatic Plants, Dehradun	Shri Nirpendra K. Chauhan Ms Hema Lohani (*Alternate*)
CKC Fragrance and Flavours Private Limited, Kolkata	Shri Rishab Kothari Shri Chandrakant Kothari (*Alternate*)
Consumer Voice, New Delhi	Shri B. K. Mukhopadhyay
CSIR - Central Food Technological Research Institute, Mysore	Shri Giridhar P. Shri Nagarajan S. (*Alternate*)
CSIR - Central Institute of Medical and Aromatic Plants, Lucknow	Dr Sudeep Tandon Dr Chandan S. Chanotiya (*Alternate*)
CSIR - Indian Institute of Integrative Medicine, Jammu	Rajneesh Anand
CSIR - Indian Institute of Toxicology Research, Lucknow	Dr Alok Dhawan Shri Somendu Kumar Roy (*Alternate* I) Dr Sheelendra Pratap Singh (*Alternate* II)
CSIR - Institute of Himalayan Bio-Resource Technology, Palampur	Dr Vijai Kant Agnihotri
CSIR - North East Institute of Science and Technology, Jorhat	Dr Samit Chattopadhyay Dr Mohan Lal (*Alternate*)
D.V. Deo Industries, Cochin	Shri Aditya Deo
Essential Oil Association of India, Delhi	Shri Ajay K. Jain Shri pradeep Kumar Jain (*Alternate*)
Fab Flavours and Fragrances Private Limited, Delhi	Shri Gurnish Singh
Forest Research Institute (FRI), Dehradun	Dr V. K. Varshney

Organization	*Representative(s)*
Fragrance and Flavour Development Centre, Kannauj	Shri S. V. Shukla Shri Nadeem Akbar (*Alternate*)
Fragrances and Flavours Association of India, Mumbai	Shri Rishabh C Kothari Shri Jaideep Gandhi (*Alternate*)
Givaudan India Private Limited, Mumbai	Shri Ajit Pal Shri Arshdeep K Joshi (*Alternate*)
Indian Beauty and Hygiene Association, Mumbai	Ms Malathi Narayanan Dr Manas V. Vyas (*Alternate*)
Indian Pharmacopoeia Commission, Ghaziabad	Dr Jai Prakash Dr Manoj Kumar Pandey (*Alternate*)
Indian Society of Cosmetic Chemists, Mumbai	Ms Monisha Mullick Dr Benedict Mascarenhas (*Alternate*)
ITC Life Sciences and Technology Centre, Bengaluru	Shri Avisek Mukhopadhyay Dr Vijayan Padmanabhan (*Alternate*)
Jagat Aroma Oils Distillery, Kannauj	Shri Pradeep Kapoor Shri Vibhu Kapoor (*Alternate*)
Karnataka Soaps and Detergents Limited, Bengaluru	Shri A. E. Shankare Gowda Dr Mokashi (*Alternate*)
L. Liladhar and Company, Mumbai	Shri Madhusoodan Mody
Lalji Aromatics Private Limited, Lucknow	Shri Rahul Mehrotra
MSME Testing Center, New Delhi	Shri Manoj Kumar Shri Vipul Gaikwad (*Alternate* I) Shri L. B. S. Yadav (*Alternate* II)
Nishant Aromas, Mumbai	Shri Ramakant Harlalka
Rakesh Sandal Industries, Kanpur	Shri Yogesh Dubey
Seth Brothers (Perfumers) Private Limited, Delhi	Shri Rohit Seth Shri Vinod Kumar Seth (*Alternate*)
S.H. Kelkar and Company Private Limited, Mumbai	Shri Amit Gulati Shri Avani Mainkar (*Alternate*)
Shriram Institute for Industrial Research, Delhi	Shri Sumant Kumar Nayak Shrimati Radhika Sharma (*Alternate*)
Som Extracts Limited, Delhi	Shri Sanjay Varshney Shri Raja Varshney (*Alternate*)
Ultra International Limited, Ghaziabad	Shri Sant Sanganeria Shrimati Bhuvana Nageshwaran (*Alternate*)
Voluntary Organisation in Interest of Consumer Education (VOICE), New Delhi	Shri M. A. U. Khan

Organization	*Representative(s)*
In Personal Capacity [*Flat no 201,Vishakha CHS Ltd, off, Swami Netyanand Marg, Near Gokhale Bridge, Andheri East, Mumbai 400069 (MS*)]	Shri G. S. Ranade
BIS Directorate General	Shrimati Meenal Passi, Scientist ‘F/ Senior Director and Head (Petroleum, coal and related products) [Representing Director General (*Ex-officio*)]

Member secretary
Shri Sourav Mondal
Scientist ‘B’/ Assistant Director
(Petroleum, coal and related products), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Head (Publication & Sales), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website-www.bis.gov.in or www.standardsbis.

This Indian Standard has been developed from Doc No.:PCD 18 (14699).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices: *Telephones*

Central : 601/A, Konnectus Tower -1, 6th Floor, DMRC Building, Bhavbhuti Marg, New Delhi 110002 — 2323 7617

Eastern : 8th Floor, Plot No 7/7 & 7/8, CP Block, Sector V, Salt Lake, Kolkata, West Bengal 700091 — 2367 0012, 2320 9474

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, Chandigarh 160019 — 265 9930

Southern : C.I.T. Campus, IV Cross Road, Taramani, Chennai 600113 — 2254 1442, 2254 1216

Western : Plot No. E-9, Road No.-8, MIDC, Andheri (East), Mumbai 400093 — 2821 8093

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. CHANDIGARH. CHENNAI. COIMBATORE. DEHRADUN. DELHI. FARIDABAD. GHAZIABAD. GUWAHATI. HIMACHAL PRADESH. HUBLI. HYDERABAD. JAIPUR. JAMMU & KASHMIR. JAMSHEDPUR. KOCHI. KOLKATA. LUCKNOW. MADURAI. MUMBAI. NAGPUR. NOIDA. PANIPAT. PATNA. PUNE. RAIPUR. RAJKOT. SURAT. VISAKHAPATNAM.

Published by BIS, New Delhi